

MOCK TEST PAPER – 1
FINAL COURSE: GROUP – II
PAPER – 5: ADVANCED MANAGEMENT ACCOUNTING
SUGGESTED ANSWERS/HINTS

1. (a) (i) Contribution per unit against sale to outside = ₹ 200 – ₹ 120 – ₹ 20 = ₹ 60
 In case of transfer, good units and rejected units are in proportion of 9:1
 In case of transfer, contribution per good unit = ₹ 190 – ₹ 120 = ₹ 70
 In case of transfer, contribution per rejected unit = ₹ 150 – ₹ 120 – ₹ 100 = – ₹ 70
 Thus, effective contribution per unit of transfer = ₹ 70 x 0.9 – ₹ 70 x 0.1 = ₹ 56
 As contribution per unit against outside sale is higher, the best strategy should be to sell maximum number of unit to outside market.
 Contribution from outside market from sale of 900 units = ₹ 54,000
 (₹ 900 x ₹ 60)
 Contribution from transfer of 300 units to Q = ₹ 16,800
 (₹ 300 x ₹ 56)
 Total Contribution from best strategy = ₹ 70,800
- (ii) If Q's demand is 540 unit, total production required = 600 units.
 (540 / 0.9)
 Taking outside market demand of 600, it is within production capacity of 1,200 units.
 Now contribution from 600 units of outside sale = ₹ 36,000
 (₹ 600 x ₹ 60)
 Contribution from rejected 60 units = ₹ (4,200)
 [₹ 60 x (– ₹ 70)]
 = ₹ 31,800
- To keep same level of contribution as in (i), the contribution required from transfer of 540 unit to Q = ₹ 39,000
 (₹ 70,800 – ₹ 31,800)
 Thus, contribution required per unit = ₹ 72.22
 ₹ 39,000 / 540
 Hence price to be charged per unit against transfer to Q = ₹ 192.2
 (₹ 120 + ₹ 72.22)

(b)	Units	Average/ hrs/u.
	1	2,000
	2	1,600
	4	1,280
	8	1,024

Material Cost / u = 10,000

Variable cost = 2,000

Variable Cost = 12,000

Option I

If both the orders came together, learning rate 80% applies and 8 units can be made, with average time of 1,024 hours per unit.

Cost to AB:

Variable cost excl. labour = ₹ 12,000

Labour cost 1,024 hrs. × 4 ₹ /hr = ₹ 4,096

= ₹ 16,096

In this case,

	Q	P	
Selling Price p. u.	₹ 17,200	₹ 16,500	→ (under option I)
Variable Cost p. u.	<u>₹ 16,096</u>	<u>₹ 16,096</u>	
Contribution p. u.	₹ 1,104	₹ 404	
No. of units	4	4	
Contribution (₹)	4,416	1,616	6,032

Option II

If P Ltd supplies its labour. 80% learning curve will apply to 4 units each of AB & P.

Hence: hrs/ u = 1,280

	Q	P	
Selling Price	₹ 17,200	₹ 14,000	
Variable Cost (excl. labour)	₹ 12,000	₹ 12,000	
Labour cost:			
1280 × 4	₹ 5,120	—	
1280 × 1	<u>—</u>	<u>₹ 1,280</u>	
Total Variable Cost	<u>₹ 17,120</u>	<u>₹ 13,280</u>	

Contribution	₹ 80	₹ 720	
Units	4	4	
Contribution (₹)	320	2,880	3,200

AB should not take labour from P Ltd. It should choose option I.

2. (a) (i)

Particular	Master Budget		Flexible Budget	Actual	Variance	
Units	10,000		9,000	9,000		
	(₹) Total	(₹) Per Unit	(₹)	(₹)		
Sales	8,00,000	80	7,20,000	7,00,000	20,000	(A)
Direct Material	2,00,000	20	1,80,000	1,84,000	4,000	(A)
Direct Wages	3,00,000	30	2,70,000	2,62,000	8,000	(F)
Variable Overhead	1,00,000	10	90,000	94,000	4,000	(A)
Total Variable Cost	6,00,000	60	5,40,000	5,40,000	-	
Contribution	2,00,000	20	1,80,000	1,60,000	20,000	(A)
Fixed Overhead	1,00,000	10	1,00,000	98,000	2,000	(F)
Net Profit	1,00,000	10	80,000	62,000	18,000	(A)

(ii) Calculation of Variances:

Material Volume Variance: $SP \times (SQ - AQ) = 20 \times (9,000 - 9,800) = 16,000$ (A)

Variable Overhead efficiency variance $SR \times (SH - AR) = 10 \times (9,000 - 8,800) = 2,000$ (F)

(b) Divestment Strategy:

Divestment involves a strategy of selling off or shedding business operations to divert the resources, so released, for other purposes. Selling off a business segment or product division is one of the frequent forms of divestment strategy. It may also include selling off or giving up the control over subsidiary where by the wholly owned subsidiaries may be floated as independently quoted companies.

Reason for Divestment Strategy

1. In case of a firm having an opportunity to get more profitable product or segment but have resource constraint, it may selling off it's unprofitable or less profitable division and utilized the recourse so released. Cost Benefit analysis & Capita Budgeting Method are the useful tool for analyzing this type of situation.

2. In case of purchase of new business, it may be found that some of the part of the acquired business is not upto the mark. In such type of situation disposal of the unwanted part of the business is more desirable than hold it.
3. In case where any business segment or product or subsidiary is pull down the profit of the whole organization, it is better to cut down of that operation of the product or business segment.

(c) **Uniform Costing:** It is not a distinct method of costing when several undertakings start using the same costing principles or practices, they are said to be following uniform costing. Different concerns in an industry should adopt a common method of costing and apply uniformly the same principles and techniques for better cost comparison and common good and helps in mutual cost control and cost reduction. Hence, it is recommended that a uniform method of costing should be adopted by the member units of an industry.

3. (a) The given problem is a balanced minimization transportation problem. The objective of the company is to minimize the cost. Let us find the initial feasible solution using Vogel's Approximation method (VAM)

Depots Plants	CA	CB	CC	CD	Capacity	Difference
CX	6	8	6	5	1,200	1,200/0
CY	4	4	8	4	1,600/800/200/0	0 0 0 0
CZ	3	7	2	8	1,200/600/0	1 4 - -

Req	1,200/600/0	800/0	600/0	1,400/1,200/0
Diff:	1	3	4	1
	1	3	-	1
	2	4	-	1
	2	-	-	1

Since the number of allocations = 6 i.e. (m+n-1), let us test the above solution for optimality.

(u_i+v_j) matrix for allocated cells

				u_i
			5	1
4	4		4	0
3		2		-1
v_j	4	4	3	4

(u_i+v_j) matrix for un allocated cells

				u_i
5	5	4		1
		3		0
	3		3	-1
v_j	4	4	3	4

$$\Delta_{ij} = C_{ij} - (u_i + v_j)$$

1	3	2	
		5	
	4		5

Since, all allocations are non negative, the allocation is optimal.

The optimal allocation are given below

Plants	Outlet	Units [A]	Cost'000 (₹) [B]	Total Cost'000 (₹) [C=(A) x(B)]
CX	CD	1,200	5	6,000
CY	CA	600	4	2,400
CY	CB	800	4	3,200
CY	CD	200	4	800
CZ	CA	600	3	1,800
CZ	CC	600	2	1,200
Total				15,400

(b)

Service Sector		Cost Unit
(i)	Hotel	Bednights available or occupied
(ii)	School	Student hours or no. of full time students
(iii)	Hospital	Patient-day / Room-day

(iv)	Accounting firm	Client hours
(v)	Transport	Passenger-Kms, or Quintal km or tonne-km
(vi)	Staff Canteen	No. of meals provided or no. of staff
(vii)	Machine maintenance	Maintenance hours to user departments
(viii)	Computer Department	Computer time to user departments.

(c) Assumed Selling Price 'P', Quantity 'Q'

The Marginal Cost of a 'Zoom' is ₹ 525 i.e. (175+350)

Demand Function for 'Zoom'

$$P = 1,400 - (75/125) \times Q$$

(Refer to working note)

$$\text{Revenue (R)} = Q \times [1,400 - 3/5 \times Q]$$

$$\text{Marginal Revenue (MR)} = 1,400 - (6/5) \times Q$$

$$\text{Marginal Cost (MC)} = 525$$

Profit is maximum where Marginal Revenue (MR) equals to Marginal Cost (MC)

$$1,400 - (6/5) \times Q = 525$$

$$Q = 729.17 \text{ Units}$$

$$P = 962.50$$

Unit selling price should be ₹ 962.50 to get maximum profit.

Working Note:

Price at which, There will be no Sale = $1,100 + 75/125 \times 500 = ₹ 1,400$

4. (a) Q will not pay P anything more than 13, because at 13, it will incur additional cost of ₹ 2/- to modify it, $13 + 2 = 15$, the outside cost.

	P		Q	R	
	Outside sale	Transfer to Q & R			
Divisional variable cost of production	7	7	19	25	
Transfer from P			13	13	
Modification			2		
Total Variable Cost of production	7	7	34	38	
Selling Price	15	13	40	50	
Contribution	8	6	6	12	

Option for R, Purchase all units from P @ 13: Any other option is costlier.

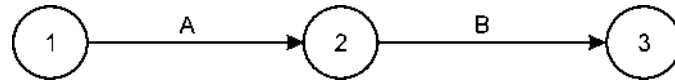
	P	Q	R
Maximum external demand	3,750	5,000	4,000
Existing capacity	5,000	2,500	2,500
Maximum capacity that can be added	5,000	1,250	2,250
Total maximum that can be produced	10,000	3,750	4,750
Additional fixed cost on expansion	24,000	6,000	18,700
Units that must be sold/transfer to get this amount as contribution	$\frac{24,000}{6} = 4,000$	$\frac{6,000}{6} = 1,000$	$\frac{18,700}{6} = 1,558.33$
External demand not covered by existing capacity	-	2,500	1,500
Decision	Expand make 10,000 units 3,750 – outside 3,750 – Q 2,500 – R	Expand make 2,500 + 1,250 = 3,750 units	Do not expand make only 2,500 units.

	P		Q	R
	Outside sale	Transfer to Q & R		
Units	3,750	3,750 + 2,500 = 6,250	3,750	2,500
Contribution / unit	8	6	6	12
Contribution (₹)	30,000	37,500	22,500	30,000
Additional Fixed Cost	67,500		22,500	30,000
	24,000		6,000	-
Net revenue addition	43,500		16,500	30,000

Individual strategy is the Company's best strategy.

- (b) (i) **Dependency Rule:** The representation of events and activities is governed by one simple *dependency rule* which requires that an activity which depends upon another activity is shown to emerge from the head event of the activity upon which it depends and that only dependent activities are drawn in this

way. Thus, if activity B depends upon activity A, then the two activities are drawn in below figure.

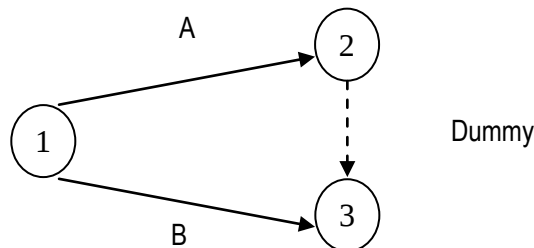


The dependency rule gives rise to two fundamental properties of events and activities:*

1. An event cannot occur until all activities leading to it are complete.
2. No activity can start until its tail event is reached.

The above two properties can be combined into a single one, namely that "no activity may start until all previous activities in the same chain are completed."

- (ii) **Dummy Activities:** Dummy Activity is that activity which does not consume time or resources. It is used when two or more activities have same initial and terminal events. As a result of using dummy activities, other activities can be identified by unique end events. These are usually shown by arrows with dashed lines.



5. (a) **Dual:**

$$\text{Minimise } 70u_1 + 60u_2 + 25u_3$$

$$\text{S.T. } 3u_1 + 5u_2 + 5u_3 \geq 50$$

$$2u_1 + 5u_2 + 6u_3 \geq 45$$

$$4u_1 + 1u_2 + 3u_3 \geq 20$$

$$2u_1 + 3u_2 + 1u_3 \geq 30$$

$$u_1, u_2, u_3, u_4 \geq 0$$

- (b) The assignment problem can be solved by applying the following steps:

Step1: Subtract the minimum element after row operation of each row from all the

elements in that row. From each column of the matrix so obtained, subtract its minimum element. The resulting matrix is the starting matrix for the following procedure.

Step2: Draw the minimum number of horizontal and vertical lines that cover all the zeros. If this number of lines is n , order of the matrix, optimal assignment can be made by skipping steps 3 and 4 and proceeding with step 5. If, however, this number is less than n , go to the next step

Step3: Here, we try to increase the number of zeros in the matrix. We select the smallest element out of these which do not lie on any line. Subtract this element from all such (uncovered) elements and add it to the elements which are placed at the intersections of the horizontal and vertical lines. Do not alter the elements through which only one line passes.

Step4: Repeat steps 1, 2 and 3 until we get the minimum number of lines equal to n .

Step5 (A): Starting with first row, examine all rows of matrix in step 2 or 4 in turn until a row containing exactly one zero is found. Surround this zero by $\square$, indication of an assignment there. Draw a vertical line through the column containing this zero. This eliminates any confusion of making any further assignments in that column. Process all the rows in this way.

Step5 (B): Apply the same treatment to columns also. Starting with the first column, examine all columns until a column containing exactly one zero is found. Mark $\square$ around this zero and draw a horizontal line through the row containing this marked zero. Repeat steps 5A and B, until one of the following situations arises:

- (i) No unmarked ($\square$) or uncovered (by a line) zero is left,
- (ii) There may be more than one unmarked zero in one column or row. In this case, put around one of the unmarked zero arbitrarily and pass 2 lines in the cells of the remaining zeros in its row and column. Repeat the process until no unmarked zero is left in the matrix.

(c) The total production overheads are ₹ 26,00,000:

Product KA: $10,000 \times ₹ 30 = ₹ 3,00,000$

Product KB: $20,000 \times ₹ 40 = ₹ 8,00,000$

Product KC: $30,000 \times ₹ 50 = ₹ 15,00,000$

On the basis of ABC analysis this amount will be apportioned as follows:

Statement of Activity Based Production Cost						
Activity Cost Pool	Cost Driver	Ratio	Total Amount (₹)	KA (₹)	KB (₹)	KC (₹)
Stores Receiving	Purchase requisition	6:9:10	2,96,000	71,040	1,06,560	1,18,400
Inspection	Production Runs	5:7:8	8,94,000	2,23,500	3,12,900	3,57,600
Dispatch	Orders Executed	6:9:10	2,10,000	50,400	75,600	84,000
Machine Setups	Set ups	12:13:15	12,00,000	3,60,000	3,90,000	4,50,000
Total Activity Cost				7,04,940	8,85,060	10,10,000
Quantity Sold				10,000	20,000	30,000
Unit Cost				70.49	44.25	33.67
Add: Conversion Cost				80	80	90
Total				150.49	124.25	123.67

6. (a)

	Order Qty 100-140 (₹)	Order Qty 141-200 (₹)
Selling Price ₹ /u	30,000	30,000
Commission @ 10%	3,000	3,000
Sales revenue p. u.	33,000	33,000
Less: Variable purchase cost	29,000	26,000
Contribution / unit (before shipping)	4,000	7,000
Less: Shipping cost > 110 units		5,000
Contribution/ units after Shipping		2,000

(i) Upto 110 units, Reference will earn a contribution of ₹ 4,000/u.

- (ii) Between 110 & 140 units, contribution of 4,000 will be wiped out by 5,000 on shipping costs. Hence we should not consider 110 – 140 range.
- (iii) 101 – 110 not to be considered since additional fixed costs 2,25,000 will not be covered by 10 units.
- (iv) Valid consideration, 100 units or 141 to 190 units.

Fixed cost of box of 50 cameras is ₹ 2,25,000

Units		100	141	150	190
No. of Camera Boxes	A	2	3	3	4
Cost of Cameras (₹)	B	4,50,000	6,75,000	6,75,000	9,00,000
Contribution (₹ /u) ₹ 4,000	C	400,000			
Contribution (₹) first 110 units @ 7,000/u	D		7,70,000	7,70,000	7,70,000
Contribution (₹) Balance units @ 2,000/u	E		62,000	80,000	1,60,000
Total Contribution (F = C + D + E) (₹)	F	4,00,000	8,32,000	8,50,000	9,30,000
Profit (F) – (B) (₹)	G	- 50,000	1,57,000	1,75,000	30,000

Best strategy buy 150 units from Champ. sell 110 at store and 40 outside.

BEP should be between 151 – 191 units

Extra Camera box cost beyond 150 units = 2,25,000

Less: Profit for 150 units = 1,75,000

Extra profit acquired = 50,000

No. of units to cover this additional costs at contribution 2,000 ₹ /u = $\frac{50,000}{2,000} = 25$

∴ BEP = 150 + 25 = 175 units

(b) Type of budgeted ratio used are:

1. Efficiency Ratio = (Standard hours + Actual hours) × 100
2. Activity Ratio = (Standard hours + Budgeted hours) × 100
3. Calendar Ratio = (Available working days ÷ budgeted working days) × 100
4. Standard Capacity Usage Ratio (Budgeted hours ÷ Max. possible hours in the budgeted period) × 100
5. Actual Capacity Usage Ratio = (Actual hours worked + Maximum possible

working hours in a period) $\times 100$

6. Actual usage of Budgeted Capacity Ratio = (Actual working hours $\div$ Budgeted hours) $\times 100$

7. (a)

Machine	Time required for products				Total Time	Time Available	Machine utilization
	W	X	Y	Z			
1	2,000	1,200	400	200	3,800	3,000	126.67%
2	2,000	1,800	600	300	4,700	3,000	156.67%
3	2,000	600	200	100	2,900	3,000	96.67%

Since Machine 2 has the highest machine Utilization it represents the bottleneck activity hence product, ranking & resource allocation should be based on contribution/machine hour of Machine 2.

Allocation of Resources						
	W	X	Y	Z	Machine Utilization	Spare Capacity
Contribution per unit (₹)	1,500	1,200	1,000	600		
Time required in Machine 2	10	9	3	1.5		
Contribution per Machine – hour (₹)	150	133.33	333.33	400		
Rank as per contribution / mach. Hour	3 rd	4 th	2 nd	1 st		
Allocation of Machine 2 time	200 $\times$ 10 = 2,000	100 (balancing figure)	200 $\times$ 3 = 600	200 $\times$ 1.5 = 300	3000	
Production Quantity	200	100/9=11.11	200	200		
Allocation Machine 1 time	2,000	11.11 $\times$ 6 = 66.66	400	200	2,666.66	333.34
Allocation of Machine 3 time	2,000	11.11 $\times$ 3 = 33.33	200	100	2,333.33	666.67

(b) Essential features of Life Cycle Costing:

Product Life Cycle costing involves :

- Tracing of costs and revenue of product over several calendar period. Throughout their entire life cycle.
- Emphasis is on Cost and revenue accumulation over the entire life cycle of the product.
- Life cycle costing traces research and design.
- It focus on development costs, incurred to individual products over their entire life cycles.
- Total magnitude of research and development costs are reported and compared with product revenues generated in later periods.

(c) Opportunity cost is a measure of the benefit of opportunity forgone when various alternatives are considered.

It is the cost of sacrifice made by alternative action chosen.

E.g. opportunity cost of funds invested in business is the interest that could have been earned by investing the funds in bank deposit.

Relevant Cost:

Expected future costs which differ for alternative course.

It is not essential that all variable costs are relevant and all fixed costs are irrelevant. Fixed, or variable costs that differ for various alternatives are relevant costs. Relevant costs draw our alternation to those elements of cost which are relevant for the decision.

E.g. Direct labour under alternative I – ₹ 10/ hour

Direct labour under alternative II – ₹ 20/ hour

Then, direct labour is relevant cost.

(d)

Type of Service	Probability	Cumulative Probability	Random No. Interval
Self- Service	0.60	0.60	00 – 59
Attended Service	0.40	1.00	60 – 99

Arrival Rate:

No. of arrivals	Probability	Cumulative Probability	Random Number Interval
0	0.20	0.20	00 – 19
1	0.10	0.30	20 – 29
2	0.35	0.65	30 – 64
3	0.30	0.95	65 – 94
4	0.05	1.00	95 – 99

- (e) Continuous improvement can be brought into the organisational culture by introducing continuously changing planned targets. One such target can be six-sigma accuracy. The sigma accuracy means the process is 99.999998% accurate. That is the process will/can produce only 0.002 defects per million. This is the structural meaning of six-sigma. In quality practice, six-sigma means 3.4 parts per million.

Six sigma is the statistical measure used to ensure quality of products and services. The six sigma academy has developed a break through strategy consisting of measure, analyze, improve and control, that allows companies to make exceptional bottom-line improvements.

In addition to the material and labour savings, which flow directly to the bottom line, a company engaged in six sigma can expect to see:

- Improved customer satisfaction
- Reduction cycle time
- Increased productivity
- Reduction in total defect
- Improved process flow

Six sigma Capability Chart

Sigma	Parts per million
Six sigma	3.4 defects per million
Five sigma	233 defects per million
Four sigma	6,120 defects per million
Three sigma	66,807 defects per million
Two sigma	3,08,537 defects per million
One sigma	6,90,000 defects per million